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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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[REDACTED] EXAMINER

HUG, ERIC J

ART UNIT	PAPER NUMBER
1731	8

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/036,770	RUTHVEN ET AL.	
	Examiner	Art Unit	
	Eric Hug	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 21 December 2001 and 15 April 2003.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-113 is/are pending in the application.

4a) Of the above claim(s) 1-68,104-111 and 113 is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 69-103 and 112 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 15 April 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____.
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) Other: _____

DETAILED ACTION

Election/Restrictions

Claims 1-68, 104-111, and 113 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7. Accordingly, claims 69-103 and 112 are presently under consideration.

Specification

The disclosure is objected to because of the following informalities:

The specification contains embedded figures (Graphs). Each must be a separate drawing having its own figure number and be described in the Brief Description of the Drawings.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 69-89 and 100-103 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 69 and 100, the phrase "an element clearance that will achieve a non-picking clearance" renders the claims indefinite. The term "non-picking clearance" is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably

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apprised of the scope of the invention. The specification instead refers to the sidewall angle of an embossing element as being an important factor with respect to sheet picking.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 69, 73-79, and 85-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulz (US 5,383,778) in view of Smook (Handbook for Pulp and Paper Technologists).

Schulz discloses an embossing apparatus designed for modifying the tensile strength of tissue products such that the tensile strength in the machine direction (MD) is nearly equal to the tensile strength in the cross-machine direction (CD). In other words, the ratio of MD strength to CD strength is closer to 1:1 after embossing than before embossing. The modification in MD tensile comes about by selectively perforating the web in a manner so that the MD extending fibers are severed to a greater degree than the CD extending fibers. Perforating is performed by a pair of embossing rolls, one roll having a plurality of protruding members that fracture the fibers while the other roll is a smooth-surfaced backing roll. The protruding members have inclined (angled) side wall portions and tapered (beveled) ends, the side wall angle chosen depending on the degree of fiber fracture desired (see column 3, lines 37-66). A vertical side wall angle (0 degrees) provides a greater tendency towards fiber fracture, although a preferred wall angle is about 6-7 degrees (column 5, line 29). As in the present invention, Schulz teaches

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embossing and perforating a tissue with elements predominately oriented CD to obtain a reduction in MD tensile without a substantial loss in CD tensile. However, Schulz differs in that the embossing apparatus has only one embossing roll with embossing elements.

Applicant has disclosed that two-roll embossing with rolls having mating embossing elements is commonly done to form apertures in tissue paper. Thus, at the time of the invention, modification of the apparatus of Schulz to include two rolls having mating elements would have been obvious to one skilled in the art.

Thus, Schulz teaches orienting perforate embossing nips (with sloped sidewalls and beveled ends) to achieve reduced MD tensile without corresponding reduction in CD tensile. The examiner directs Applicant to page 339 of Smook which shows that a typical fourdrinier paper has a MD to CD tensile ratio of much greater than 1.0, typically 1.5-2.0. Therefore, by bringing the MD to CD ratio closer to 1:1, a MD tensile reduction substantially greater than 30% (the largest claimed value) is achieved. With respect to the claims:

Claim 69: This claim pertains to two embossing/perforating rolls with elements predominately oriented CD, a non-picking element clearance, and at least a 15% reduction in MD tensile. All of these elements have been addressed above, except for the non-picking element clearance when two rolls with embossing elements are used. However, the specification of the present invention relates the non-picking clearance to the sidewall angle. Since the sidewall angle of the elements in Schulz is 6-7 degrees, and reads on the sidewall angles of the claims, then one would expect that the embossing elements of Schulz meet the criteria for non-picking element clearance.

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Claims 73-74: The orientation of embossing elements is preferably 90 degrees, which reads on the claimed angles of orientation.

Claims 75-79: Element height is given in column 8, line 3, as being 20-100 thousandths of an inch (mils), which reads on the claimed ranges.

Claims 85-89: A sidewall angle of 7 degrees (described above) reads on the claimed ranges.

Claim 90: This claim pertains to a method of reducing the tensile ratio of a web by embossing with two embossing/perforating rolls having elements oriented CD, which has already been discussed above.

Claims 91-95: The tensile ratio reduction and embossing element (perforate nip) orientation is discussed above.

Claim 96: This claim pertains essentially to the method of claim 90 using elements having beveled ends, which has been discussed above.

Claim 97: This claim pertains essentially to the method of claim 90 using elements having a sidewall angle less than 20 degrees, which has been discussed above.

Claims 98-99: A sidewall angle of 7 degrees (described above) reads on the claimed ranges.

Claim 100: This claim pertains essentially to the method of claim 90 using elements having a non-picking element clearance, whereby the non-picking clearance has been linked above to the sidewall angle of the embossing elements.

Claims 101-103: Schulz teaches that the method of reducing MD tensile is suitable for

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paper towels and toilet tissues, which are known in the art to be creped, uncreped, and/or calendered products.

Claim 112: This claim pertains to two embossing/perforating rolls with elements predominately oriented CD and a tensile ratio reduced by 5% of the initial tensile ratio of the base sheet before embossing. As discussed above, by bringing the MD to CD ratio to 1:1, a MD tensile reduction substantially greater than 30% (the largest claimed value) is achieved.

3. Claims 70-72 and 80-84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulz (US 5,383,778) in view of Smook as applied to claim 69 above, and further in view of Bauernfeind (US 4,759,967) or Kamps et al (US 5,702,571).

The teachings of Schulz are described above with respect to embossing a web in a manner to reduce MD tensile with minimal reduction of CD tensile. However, one must go to other teachings to determine how embossing elements are shaped and aligned for two rolls having mating embossing elements.

Bauernfeind discloses embossed tissue products having elongated embossments oriented in the cross-machine direction (CD) of the sheet. The embossing device comprises two rolls having mating embossments. Bauernfeind teaches that it is desirable to have substantially all of the embossing elements oriented in the CD of the sheet so that the CD tensile strength degradation due to fiber breakage is minimized. Reduced CD tensile strength degradation is desired, because a typical sheet has lower CD tensile strength than machine-direction (MD) tensile before embossing. Suitable elongated embossing shapes given by Bauernfeind include

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ovals, rectangles, diamonds, polygons, or any other suitable shapes. Figure 3 shows the embossments in full-step alignment.

Similarly, Kamps teaches embossing a tissue between two embossing rolls having male and female embossing elements. Embossing patterns are designed to maximize sheet bulk while minimizing the loss of strength that comes about by rupture of fibers during the embossing process. Embossing patterns considered to be most useful for minimizing strength loss are given in Figures 2, 4 and 5, whereby the patterns of Figures 2 and 5 having elongated individual embossments. In Figure 2 the major axis of the embossing elements are oriented 65 degrees to the circumferential direction of the roll (column 7, line 28). In Figure 5, every other embossing elements is rotated 90 degrees. Thus, the most useful embossing patterns have the embossments oriented lengthwise primarily in the cross-machine direction. The preferred shape of the embossing elements is oval. Figure 2 shows the embossments in half-step alignment. Kamps also discloses that the preferred male/female engagement of the embossing elements is 0.25 to 0.50 millimeters (column 4, lines 37-38) which is equivalent to a range of about 10-20 mils.

Therefore, Bauernfeind and Kamps teach element shape, alignment, and engagement for two embossing rolls having CD oriented embossing elements, and therefore, at the time of the invention it would have been obvious to one skilled in the art to shape, size, and engage the embossing elements of Schulz accordingly to provide an embossing apparatus that significantly reduces MD strength without significantly reducing CD strength.

With respect to the claims, hexagonal-shaped embossing elements and quarter-step element alignment is not expressly disclosed by either Bauernfeind or Kamps. However, these claims are unpatentable in view of the shapes and alignments given above, because the courts

have determined that change in form or shape is an obvious engineering design. See *In re Dailey*, 149 USPQ 47 (CCPA 1976).

4. Claims 90-95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schutte et al (US Re.27,453) in view of Schulz (US 5,383,778) and Smook (Handbook for Pulp and Paper Technologists).

Schutte discloses an embossed absorbent paper towel formed by passing a fibrous web between two embossing rolls. The embossing rolls both have surfaces of elongated protrusions and depressions. Each roll is mounted with the embossing elements in juxtaposition to those of the other roll. The rolls are designed to compress portions of the surface of the web and also to stretch the web between the compressed areas beyond the elastic limit of the fibers, thereby separating the fibers and increasing the web porosity in the stretched areas. As a result, apertures 26 appear corresponding to the shape of the embossing elements are formed in the direction of the paper 90 degrees transverse to the running direction (Figure 5 and column 4, lines 39-51). Thus the perforate nips are all cross-direction (CD). Schutte does not disclose how the embossing structure impacts the machine-direction (MD) or CD tensile strength of the sheet.

Schulz (described above) discloses an embossing apparatus designed for modifying the tensile strength of tissue products such that the MD tensile strength is nearly equal to the CD tensile strength. The modification in MD tensile comes about by selectively perforating the web in a manner so that the MD extending fibers are severed to a greater degree than the CD extending fibers. Thus, Schulz teaches that aperturing a web with elongated apertures oriented in the CD direction reduces the ratio of MD to CD strength closer to 1:1. Therefore, since Schutte

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discloses such a perforated web having CD oriented elongated apertures, then Schutte inherently reduces the tensile ratio of the web during embossing as discussed by Schulz. The degree of tensile ratio reduction would be expected to be much larger than the claimed 30% (of claim 93) as taught by Smook (described above).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Bredendick et al (US 5,861,081) discloses a paper towel having elongated hexagonal perforated and non-perforated embossments oriented in the machine direction.

Wosaba II (US 3,337,388) discloses an embossed paper towel prepared by the action of elongated embossing protuberances without perforating the sheet. The embossing protuberances are elongated in the machine direction.

Conradson (US 1,384,515) discloses a paper towel having elongated perforations.

Swanson (US 6,383,958) and Perez et al (US 6,432,527) disclose cross-direction tearable tapes made by embossing a web with embossments oriented primarily in the cross-direction.

Majors et al (US 5,704,101) and Giacometti (US 6,007,468) disclose apertured webs formed by passing webs between two embossing rolls.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 703 308-1980. The examiner can normally be reached on Monday through Friday, 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 703 308-1164. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0651.

Eric Hug
jeh
June 12, 2003

Stev P. Griffin
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